



March 15, 2002

Washington State Legislative Building Rehabilitation Project

I just wanted to send out an update on some testing and estimating activity that involves the Leg Building.

Project Consultants:

The design consultants have been in town all week and have spent refining their knowledge of the building. They have been working on the schematic design and giving information to the contractor (Mortenson) so that they can arrive at an accurate estimate of the project costs. The consultants will be returning during the week of March 25th and we will be meeting with the various tenants to go over current space layouts.

As part of the estimating process, Mortenson will be inviting different sub-contractors to tour the building. I have been advised that The Hermanson Company (a mechanical subcontractor) will be given a tour that will be taking place Monday, March 18th. They are scheduled to be here at 8:00a.m. and they anticipate bringing 6 to 8 representatives. Since they are not familiar with the building, the tour is expected to last until noon. Mortenson will check in with the reception area of each tenant prior to entering the spaces.

I will advise as additional tours are scheduled.

Results of “Push Test”:

I wanted to update folks on the results of the “push-test” that took place in the Auditor’s office on February 28th. A section of wall was repaired and modified to represent a typical wall in the Legislative Building. Our goal was to determine how much force the walls would take before they would fail. The Legislative Building Rehabilitation Project is involved in developing a seismic upgrade plan that would assure maximum safety to the building occupants as they exit the building during an “event”. Since many of the exit routes travel next to “hollow-clay” tile walls, we needed to see if they required additional structural support. The “push-test” was designed to exert a steady pressure against the wall and then use scientific instruments to measure movement. Textbook calculations of forces exerted against a hollow-clay tile wall would indicate that the wall should have failed at 600 lbs. of force against the wall section. That failure would have result in cracking of the tile, or possible collapse of the wall. I’m attaching a picture of the test frame that was used in the “push test”.



Three prior major earthquakes have produced cracks in these walls, but they have not failed. The wall structures have remained attached at the top and bottom and have not collapsed. The architects and contractor on our project suspect that the construction methods used in building these walls have produced a superior wall. The partition walls have 1" of plaster on each side and most of the walls also have a wainscot that may provide additional support. It is important to note that cracks in walls are not dangerous as long as the wall remains standing. The cracks help to relieve the energy that travels in an earthquake and then runs into a building. Our building has done a great job of withstanding those energies and providing safe exiting routes.

Our investigation of the building structure will tell us how much more seismic upgrading will be needed.

Current city code requires that the wall withstand a total lateral force of 1,600 lbs. - a force equal to 60% of the weight of the wall. Old hollow clay-tile walls often require some form of reinforcement to withstand that level of pressure. This reinforcement is called "strong-backing" and can be accomplished in many ways - all of them expensive.

The test on the hollow-clay tile wall in the Auditor's office was witnessed by project team members, Building Officials from the City of Olympia, FEMA, SHPO, TVW and staff from the Auditors office. The testing process was a lengthy one that required small increases in pressure with periods of waiting to see if the wall settled into a failure. The wall withstood a pressure of 1,600 lbs. - the pressure computed to meet the city code. The project team then made the decision to continue the test to establish a level of "margin of safety". The test continued to 2,000 lbs. - a force equal to 75% of the weight of the wall - and still did not fail! It must be noted that the wall did flex (in a bow shape), but did not crack. Nor did it break away from the ceiling or floor. We are still awaiting the written test results based on the measurements taken during the test. But preliminary evidence would suggest that the skilled trades people built a great building for us 75 years ago.

Proposed "Pull Test"

Another area of investigation will focus on the strength of the marble installation in the Leg Building. Since marble is another material that lines many of the exiting routes, we want to see how much "pull" force can be exerted before the marble panels come away from the wall structure. The panels are attached in multiple ways that help to assure the strength of the installation. The panels have an application of mortar to the back sides of the marble. There is also a copper wire inserted into the sides of the panel with the ends of the wire embedded in the wall. The marble panels are also interlocked with the adjoining panels to form a "system" that holds the individual pieces together.

We plan to do a "Pull Test" to help us determine if we need to do any seismic upgrading to the marble installation. This test will take place on the 2nd, 3rd and 4th floors of the

Legislative Building on each of the four “legs” in the central rotunda area. The marble is installed on the concrete legs that hold up the dome. A force of 5 - 10lbs/square foot will be applied to try to pull the marble off the wall. This force will represent 60% of the weight of the marble on the wall (the same standard used on the “Push Test” described above. We will be using a “test bed” that has suction cups and a capability of increasing the pull pressure in incremental levels.

We want to minimize the impact on the tenants of the Leg Building so we have scheduled the test to take place at 1:00am on Tuesday morning, March 19th. Testing on the 12 panels (4 panels on each of the 2nd, 3rd and 4th floors) will take about 4 hours.

Scaffolding will be brought into the building at 4:00pm on Monday, March 18th and will be installed beginning at 8:00pm. All the scaffolding will be removed and the areas cleaned up by 8:00am Tuesday morning (March 19th). There is no danger to the building structure and the information gained from this experiment will help us assure a safe building. I’ll report on the results of the test in my next update.

Please feel free to contact me with any questions or comments.

Thanks,

Andy Stepelton

Senior Property Manager

Legislative Building Rehabilitation Project

General Administration

Voice at GA: (360) 902-0926

Voice at Leg: (360) 786-7079

Pager: (360) 456-9283

E-mail at GA: astepel@ga.wa.gov

E-mail at Leg: Stepelto_An@leg.wa.gov